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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,139	08/06/2001	Leonel R. Arana	010400	8960
26285	7590	12/16/2004	EXAMINER	
KIRKPATRICK & LOCKHART LLP 535 SMITHFIELD STREET PITTSBURGH, PA 15222			CREPEAU, JONATHAN	
			ART UNIT	PAPER NUMBER
			1746	

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/923,139

Applicant(s)

ARANA ET AL.

Examiner

Jonathan S. Crepeau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-61 and 73-75 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 24-61, 74 and 75 is/are allowed.
- 6) ☒ Claim(s) 1-19, 23 and 73 is/are rejected.
- 7) ☒ Claim(s) 20-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-61 and 73-75. Claims 24-61, 74, and 75 are allowed, and claims 20-22 are objected to. Claims 1-19, 23, and 73 remain rejected for substantially the reasons of record. Accordingly, this action is made final.

Claim Rejections - 35 USC § 102

2. Claims 1-4, 8, 10-12, 15-17, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Hoffman (U.S. Patent 6,194,066). The reference teaches a micromachined device comprising a tube (see abstract). The tube can be used in micro hydraulic applications (see col. 8, line 34). Regarding claims 1, 3, and 4, the tube has a wall thickness of less than 0.01 microns (see col. 3, line 20). Regarding claim 2, the tube inherently has inlet, intermediate, and outlet portions. Regarding claims 15 and 16, a catalyst may be disposed within the tube (see abstract). Regarding claim 17, the tube may be used in a sensor (see col. 5, line 66). Regarding claim 12, the tube may be filled with a material, thereby allowing it to function as a static mixing structure (see col. 5, line 56). Regarding claims 10 and 11, the reference also anticipates the claimed "post" since the interior of the tube may have a roughened surface (see col. 5, line 57). Regarding claim 23, the micromachined device may be a heat exchanger (i.e., a refrigeration device) (see col. 8, line 27).

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

3. Claims 3, 9, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoffman.

The reference is applied to claims 1-4, 8, 10-12, 15-17, and 23 as stated above. However, the reference does not expressly teach that the tube comprises silicon nitride (claim 3), that the tube is generally U-shaped (claim 9), or that a stop valve is disposed within the tube (claim 13).

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the reference fairly suggests all of the above-noted features to the skilled artisan. Regarding the shape of the tube, in column 3, line 23, the reference teaches that "tubes formed in this way may be fabricated to stand alone in practically any shape imaginable." Regarding the claimed SiN composition, the reference teaches in column 2, line 62 that the tube may comprise a "nitride." Additionally, the limitation that the tube contains a stop valve would be rendered obvious based on the disclosure of fuel injectors and micro hydraulics in column 8, lines 25-36. As such, the instant claims are not considered to be distinguished over the Hoffman reference.

4. Claims 1, 2, 6-9, 14, 17-19, and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadigadapa et al (U.S. Patent 6,477,901).

The reference is directed to a micromachined fluidic apparatus comprising a substrate (101) and a tube (106) (see Fig. 1). Regarding claims 2, 9, and 73, the tube is U-shaped and

includes inlet, outlet and intermediate portions (see Fig. 1). Regarding claims 6, 7, and 14, the substrate includes inlet and outlet portions (307) which are connected to the inlet and outlet of the tube (see Fig. 3). Regarding claim 17, the micromachined device can be used as a sensor (see abstract). Regarding claim 18, the device comprises an actuator (see col. 3, line 56). Regarding claim 19, the substrate defines a sealed cavity wherein substantial portions of the tube are disposed within the cavity (see Fig. 4).

The reference does not expressly teach that the wall of the tube has a thickness of less than 50 microns, as recited in claim 1.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the reference's general disclosure of a "micromachined" apparatus would fairly suggest to the artisan that the tube walls are less than 50 microns thick. As is appreciated in the art (note instant specification, page 10), the term "micromachined" generally refers to dimensions on the micron scale. As such, the claimed wall thickness of less than 50 microns is not considered to distinguish over the reference.

Response to Arguments

5. Applicant's arguments filed November 18, 2004 have been fully considered but they are not persuasive. Applicants assert that "[n]either Hoffman nor Tadigadapa, alone or in combination, teach or suggest a fluid conducting tube that is adapted for thermal processing of at least one fluid stream, as is recited in amended independent claim 1. Instead, Hoffman teaches a

tube that may be used in applications such as microfluidics or heat exchange, which are significantly different from thermal processing of fluids.” However, the language “adapted for...” is still not considered to impart a structural distinction to the presently claimed apparatus. As long as a prior art structure is capable of performing the claimed function, then it meets the claim. See MPEP §2114. Furthermore, Applicant’s argument that thermal processing of fluids is significantly different from microfluidics or heat exchange is not persuasive. It is believed that the term “thermal processing of fluids” encompasses a wide variety of processes, including heat exchange. As such, even if the amendatory language were to be given weight, it would still not distinguish over the Hoffman reference.

Allowable Subject Matter

6. Claims 24-61, 74, and 75 are allowed.
7. Claims 20-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
8. The following is a statement of reasons for the indication of allowable subject matter:

The reasons for allowance of the instant claims were given in the previous Office action and remain applicable herein.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau
Primary Examiner
Art Unit 1746
December 13, 2004